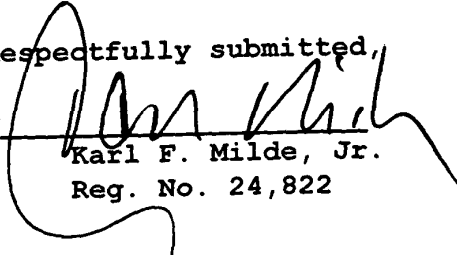


the International Application No. PCT/NL00/00423 under

Article 19. No new matter has been introduced.

Respectfully submitted,

By


Karl F. Milde, Jr.

Reg. No. 24,822

MILDE, HOFFBERG & MACKLIN, LLP
10 Bank Street - Suite 460
White Plains, NY 10606
(914) 949-3100

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Working method for separately packaging various types of food in a single package as well as package manufactured according to this working method.

5 BACKGROUND OF THE INVENTION

Field of the invention

10 The invention relates to a ~~working method for separately packaging various types of food in a single package, comprising: placing food on a tray with various compartments that are open on one side with one type of food placed in each compartment after which a film structure is placed above the open sides of the compartments, whereby above each compartment a part of the film structure is placed, followed by fastening the film structure on the tray around the open sides of the~~
15 compartments package comprising a tray with various compartments in which different types of food are present, with one type of food being present in each compartment, which compartments are closed off by a film structure that is fastened to the tray around the openings of the compartments, with part of the film structure being present above each compartment of the tray, and at least a number of parts of the
20 film structure are different from each other. The term film structure can be understood to mean either one single film or a combination of various films on and/or beside each other, as well as film with a substance or a sticker on it.

25 Such packages are usually intended to allow consumers to quickly and easily prepare their own meals. Many or all of the necessary ingredients are present so that the consumer himself need not buy all the ingredients separately.

Prior art

30 Such a ~~working method is known from European patent no. 0 293 794 B1. In this known working method various types of food are packaged in a single package. To improve the shelf life of the various types of food, in the known working~~

method the various types of food are stored under different atmospheric conditions. Some types of food are preferably stored in an oxygen-low environment while others instead are better stored in an atmosphere that is rich in oxygen. To this end, in the known working method the option exists of introducing preservative gases into the package during packaging in the various compartments of the package. In the known working method the possibility also exists of creating overpressure, underpressure, or a vacuum in one or more of the compartments during packaging. package is known from US 5.126.518. In this known package some parts are provided with a layer of microwave-reflective material and other parts not to effect a decreased flow of microwave energy to the foodstuffs in certain zones of the tray and an enhanced flow of microwave energy to the foodstuffs in the remainder of the tray.

Summary of the invention

An objective of the invention is to provide a package working method of the type described in the preamble for the packaging of various types of food in a single package, in which even better individual circumstances can be created for the various types of food than with the known working method. for preservation of the food in the different compartments. To this end the package the working method according to the invention is characterized by the fact that the film structure is composed and/or processed such that the characteristics of at least some of the specified parts of the film structure are different from each other these parts are gas-permeable and/or that a material which reacts with gasses in the respective compartments is provided in and/or on the film structure. This creates circumstances for the food in the package that are even better adapted per type of food. For example the space in a compartment of the package can be fully sealed off from the outside environment by an gas-impermeable part of the film structure, or indeed interacting with the outside environment by way of a gas-permeable part of the film structure. For example in at least some of the parts of the film structure there can be perforations; in and/or on at least a number of parts of the film structure an active element or active

~~substance can be present, or at least in a number of parts of the film structure a passive element can be present that manipulates radiation~~

In addition, the various characteristics can be acquired because the film structure is comprised of various films, for example a first film and a second film or a sticker that is present on parts of the first film, or two or more films beside each other with different characteristics.

It is noted that from US-A-4.935.252 a food package is known having a film structure comprising two films of which one is applied on the other and can be removed. This package contains only one compartment. Furthermore the differentiation of the film structure only relates to characteristics for preparation of the food and not for preservation

~~The differences between the characteristics of the parts of the film structure are preferably different in a material sense, for example gas permeability, which factors have an influence upon the condition of the food in the compartments. The imprinting of parts of a transparent film with ink has little or no effect on the condition of the food so there is hardly a difference from the parts of the film which are not imprinted.~~

It is noted that from European patent no. 0 293 794 B1 a working method is known in which various types of food are packaged in a single package. To improve the shelf life of the various types of food, in the known working method the various types of food are stored under different atmospheric conditions. Some types of food are preferably stored in an oxygen-low environment while others instead are better stored in an atmosphere that is rich in oxygen.

By utilizing a differentiated film structure according to the present invention in which the closure of each compartment can be coordinated with the type of food present in the compartment and the condition of the food, an optimal environment can be created for the food. In this way even in a package where no separate gas atmospheres are present in the compartments good circumstances can nonetheless be obtained for the food.

~~An embodiment of the working method according to the invention is characterized by the fact that in the composition and/or processing of the film~~

~~structure in at least a number of the specified parts an active element can be introduced into the film structure. The term active element should be understood to mean an element that reacts with substances in the food or substances that are emitted by the food.~~

5 ~~Preferably the active element in the form of~~ For example the material
can be an active substance which is placed in and/or on the parts of the film structure.
~~For example~~ The substance might be a material that reacts with the oxygen in the
compartment and thus removes the oxygen from the compartment and the food. This is
desirable for those types of food that can be stored best in a low-oxygen atmosphere,
10 for example for the protection of flavor and aroma against oxidation. Such substances
are generally known, for example films that contain iron powder. The iron powder
rusts and oxygen is withdrawn from the food and the atmosphere in the compartment.
Instead of iron powder ascorbic acid or sulphite can also be used as an active
substance. These substances, too, oxidize and oxygen is withdrawn from the food and
15 the atmosphere in the compartment. In addition, enzymatic-acting substances can be
applied to the film, such as glucose oxidase or ethanol oxidase in which enzymes are
catalysts for an oxygen-consuming reaction.

The substance can also be a material, for example, that absorbs oxygen,
for example a film of nylon polymer in which cobalt is present for a cobalt-catalyzed
20 oxidation of the nylon polymer. Instead of, or in addition to, oxygen-absorbing
substances, the film or sticker can also contain CO₂ absorbing or emitting substances,
or ethylene absorbing substances, ethanol emitting substances, moisture-absorbing
substances, etc. All of these substances are generally known.

The material ~~active element~~ can also be formed by applying a film
25 structure that is activated upon radiation. By only radiating a number of the parts of the
film structure, a film structure with varying characteristics is created. The material of
the film structure should in this case be such that its characteristics can be changed by
radiation or because certain substances in the material of the film structure can be
activated by radiation. For example ~~the material of the film structure can discolor in~~
30 ~~response to radiation and form a light barrier. In addition, as a result of radiation the~~
~~material can be activated such that for example it obtains the characteristic that it~~

reacts to oxygen and thus removes the oxygen from the compartment. Such a film is known from European patent application EP-A 0 520 257. This known film contains a combination of an oxidizable organic compound and a metallic transference catalyst. Here oxidation of the organic compound can be initiated by radiation. This known package consists of only one compartment. Furthermore in this known package the entire film is irradiated, there is no differentiation of the film. The manner of radiating is known from the international patent application WO 99/21699. ~~Through this reference both documents are included in the present patent application.~~ In this way food can be packaged both in a low-oxygen environment and a high-oxygen environment in a single package.

The invention also relates to a ~~package manufactured according to the working method according to the invention comprising a tray with various compartments in which various types of food are present, with one type of food in each compartment, which compartments are closed off by a film structure that is connected to the tray around the openings of the compartments, where above each compartment part of the film structure is present for separately packaging various types of food in a single package, comprising: placing food on a tray with different compartments open on one side, with one type of food being placed in each compartment, then placing a film structure above the open sides of the compartments, whereby above each compartment a part of the film structure is placed, at least the characteristics of some of the specified parts of the film structure are different from each other, followed by sealing fastening the film structure to the tray around the openings of the compartments.~~

As far as the working method package is concerned the invention is characterized in that ~~the characteristics of at least some of the parts of the film structure are different the film structure is comprised or processed such that the characteristics of at least some of the specified parts of the film structure are different from each other~~ some of the parts of the film structure are gas permeable and/or are provided with a material in and/or on the film structure which material reacts with gasses in the respective compartments.

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Processing the film structure can comprise for example placing perforations in at least a number of the parts of the film structure, for example to allow the food to breathe. The size of the perforations or the number of perforations can be adjusted depending on the degree of respiration of the food. A film with microperforations can also be used.

~~A further embodiment of the working method according to the invention is characterized in that at the composition and/or processing of the film structure in at least some of the parts of the film structure, a passive element is introduced that manipulates radiation. Under a passive element that manipulates radiation one should think of an element that can resist radiation - for example microwaves in a microwave oven - reflect them, redistribute them, or absorb them and convert them into heat. For example an aluminum film can modify the field in a microwave such that the capacity in the microwave unit is redistributed and even heating is obtained. Materials that can absorb microwave energy and convert it into heat are, for example, aluminum, stainless steel and inconel.~~

The composition of the film structure can for example take place by using first one film and then on parts of that film placing a second film or sticker. The second film or sticker can for example contain the above-mentioned active substance or consist of one of the above-mentioned materials that influence radiation. Or the first film can be perforated and the second film or sticker can be gas impermeable and seal off parts of the first film.

The film structure can also be composed for example by fastening two films to each other, after which one of the films is locally removed. The one film can for example be perforated and the other film can be a gas-impermeable film that is placed in separate parts on the perforated film. Parts of the gas-impermeable film can for example be peeled off the perforated film.

Yet another method of composing the film structure can for example be to place two or more films with different characteristics beside each other on the tray. For example the various films can contain an active substance, be perforated, be made of a radiation-influencing material, or be gas impermeable. Possibly the films can first be connected with each other before being placed on the tray.

AMENDED SHEET

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The composition and/or processing of the film structure preferably takes place before food is placed on the tray. This decreases the chance that waste materials that may occur during the processing end up in the food.

Another favorable embodiment of the working method according to the invention is characterized in that, before the film structure is composed and/or processed, first the characteristics of the food are determined, after which the composition and/or processing of the film structure takes place according to the characteristics of the food. Thus the conditions under which the food is stored can be better coordinated with the actual condition of the food. For example, if the respiration of the food is high, it may be desirable that the space in the compartment be more connected with the environment, such that a film structure with high permeability is desirable.

Brief description of the drawings

The invention will be elucidated more fully below on the basis of drawings in which embodiments of the working method and the package according to the invention are shown. In these drawings:

Figure 1 shows an embodiment of the package according to the invention in a top view,

Figure 2 shows the illustration in Figure 1 as a cross-section;

Figure 3 shows a diagram of a first embodiment of the working method according to the invention;

[Further page 6, line 1]

CLAIMS:

1. Package (1) ~~manufactured according to a working method according to one of the preceding claims,~~ comprising a tray (3) with various compartments (5, 7, 9) in which different types of food (17, 19) are present, with one type of food being present in each compartment, which compartments (5, 7, 9) are closed off by a film structure (11) that is ~~fastened~~ sealed to the tray (3) around the openings of the compartments, above each compartment (5, 7, 9) of the tray a part (21, 23, 25) of the film structure (11) being present, characterized in that the characteristics of and at least a number of these parts (21, 23, 25) of the film structure (11) are different from each other, characterized in that these parts (21, 23, 25) are gas-permeable and/or that a material which reacts with gasses in the respective compartments is provided in and/or on some of these parts of the film structure (11).

~~13. Package according to claim 12, characterized in that in at least some of the specified parts an active element is present in the film structure.~~

~~14. Package according to claim 13, characterized in that the active element in the form of an active substance is present in and/or on the parts of the film structure.~~

2. Package according to claim 1 ~~12, 13 or 14,~~ characterized in that there are perforations (31) in ~~at least~~ some of the parts (23) of the film structure (11).

~~16. Package according to claim 12, 13, 14 or 15, characterized in that in at least some of the parts of the film structure a passive element is present and manipulates radiation.~~

3. Package according to ~~one of the preceding claims 12 through 16~~ claim 1 or 2, characterized in that the film structure (11; 43; 75) is comprised of a first film (29; 45; 71) in which on some parts (25; 77) of this film a second film (47; 73) or a sticker (23) is present.

4. Package according to ~~one of the preceding claims 12 through 17~~ claims 1, 2 or 3, characterized in that the film structure (65) is comprised of two or more adjacent films (61, 63) with different characteristics.

5. Working method for separately packaging various types of food in a single package, comprising:

- placing food (17, 19) on a tray (3) with different compartments (5, 7, 9) open on one side, with one type of food (17, 19) being placed in each compartment (5, 7, 9),
- then placing a film structure (11) above the open sides of the compartments (5, 7, 9), whereby above each compartment a part (21, 23, 25) of the film structure (11) is placed, at least the characteristics of some of the specified parts (21, 23, 25) of the film structure (11) are different from each other,
- followed by sealing ~~fastening~~ the film structure (11) to the tray (3) around the openings of the compartments (5, 7, 9),

characterized in that the film structure (11) is ~~comprised or processed~~ such that ~~the characteristics of at least some of the specified parts of the film structure are different from each other~~ some of the parts (21, 23, 25) of the film structure (11) are gas permeable and/or are provided with a material in and/or on the film structure (11) which material reacts with gasses in the respective compartments (5, 7, 9).

2. ~~Working method according to claim 1, characterized in that at the composition and/or processing of the film structure in at least some of the parts mentioned an active element is introduced into the film structure.~~

3. ~~Working method according to claim 2, characterized in that the active element in the form of an active substance is placed in and/or on the parts of the film structure.~~

6. Working method according to claim 5, characterized in that ~~at least~~ some of the parts (21, 23, 25) of the film structure (11) are irradiated.

7. Working method according to ~~one of the preceding~~ claim 5 or 6, characterized in that perforations (31) are made in ~~at least~~ some of the parts (23) of the film structure (11).

6. ~~Working method according to one of the preceding claims, characterized in that in at least some of the parts of the film structure a passive element is placed that manipulates radiation.~~

8. Working method according to one of the preceding claims 5 to 7, characterized in that the film structure (11; 43; 75) is ~~comprised~~ produced by taking

of a first film (29; 45; 71) on parts (25; 77) of which with a second film (47; 73) or sticker (23) ~~being is placed on parts of the first film.~~

5 9. Working method according to one of the preceding claims 5 to 8, characterized in that the film structure is ~~comprised~~ produced by fastening two films on each other, after which one of the films is removed locally.

10. Working method according to one of the preceding claims 5 to 9, characterized in that the film structure (65) is ~~comprised~~ produced of two or more ~~adjacent~~ films (61, 63) with different characteristics which are adjacent to each other.

10 11. Working method according to one of the preceding claims 5 to 10, characterized in that the composition and/or processing of the film structure takes place before food is placed on the tray.

15 12. Working method according to one of the preceding claims 5 to 11, characterized in that before the film structure is ~~comprised and/or~~ processed first the characteristics of the food are determined, after which the composition and/or processing of the film structure takes place in accordance with the characteristics of the food.